

**REMOTE CONTROL SERVICE PROCESSING DEVICE USING GUI
IN HOME NETWORK ENVIRONMENT**

CROSS-REFERENCE TO RELATED APPLICATIONS

[01] This application claims the benefit of Korean Patent Application No. 2003-04913 filed January 24, 2003 in the Korean Intellectual Property Office, the disclosure of which is incorporated herein by reference.

BACKGROUND

1. Field of the invention

[02] The present invention relates to a remote control service processing device, and more particularly, to a remote control service processing device which is capable of controlling various devices through a graphic user interface (GUI) in a home network environment.

2. Description of the Related Art

[03] With a rapid development in the communication technology, the Internet has connected communications terminals around the world into one big network. Various digital information home appliances such as Internet refrigerator, digital TV, set top box which are designed to be accessible to the Internet are now widely used, and home networks, which connect these information home appliances into one network have also been introduced.

[04] In order to connect the Internet with the home network, a home gateway is used inside the house. The home gateway provides various services for the mutual communications among the information home appliances in the house, and through the services provided, the user can grasp and even control the operational status of the respective appliances.

[05] As the demand for a large screen as big as that of a theater for home use has also been increasing, a so-called 'home theater' has been introduced. The home theater mainly consists of a plasma display panel (PDP), a DVD player, an AV amp, a set-top box (STB) and a plurality of speakers as one system, and these components are organically connected with one another. The respective components of the home theater also participates as one element of the home network.

[06] However, although the various components are organically connected in a system such as home theater, an operator of the system still experiences inconvenience because he/she has to manipulate the respective components using a separate remote controller following predetermined steps. For example, in order to watch the DVD instead of TV, the operator first has to manipulate a remote controller for the STB and another remote controller for AMP before manipulating the remote controller for the DVD player.

[07] FIG. 1 is a view for explaining a manipulation method of remote controllers in order to use the DVD player instead of TV. More specifically, FIG. 1 illustrates a PDP remote controller 110, a DVDP remote controller 120, a STB remote controller 130 and an AMP remote controller 140. In a state

that all of the PDP, STB, DVDP and AMP are on, the operator wishing to use the DVD instead of TV selects a component key 112 through the PDP remote controller 110 and thus selects image output. Next, the operator selects a TV/external input key 132 through the STB remote controller 130 and thus sets external input. Then the operator selects a DVD key 142 of the AMP remote controller 140, and selects a reproducing key 122 of the DVDP remote controller 120. After that, the operator adjusts DVD reproducing environments such as a volume through the use of environment setting keys 114 of the AMP remote controller 140.

[08] As described above, the operator of the conventional home theater system is required to manipulate not only the current remote controller but also the other remote controllers in order to change the operating device to another one. This makes the manipulation process complicated, and as the manipulating of the system is complicated, the operator rather chooses to use a certain one fixedly rather than to enjoy various functions of the system.

[09] In an attempt to solve the problems as described above, many distributors have tried to develop an integrated remote controller. However, the distributors suffer from high research and developing costs, while the customers also suffer from the financial burden of having to purchase a high-priced integrated remote controller, separately. For the customers who use components of a home theater system from different distributors, using an integrated remote controller is still more inefficient.

[10] Furthermore, the operator of the home theater system can use the remote controllers or integrated form of them somewhat efficiently in an environment where the respective components are installed near to one another. However, if the components are installed rather remotely from each other, a remote controller loses its usefulness.

SUMMARY

[11] In an effort to solve the problems as described above, it is an aspect of the present invention to provide a remote control service processing device which is capable of providing a remote control service through a graphic user interface (GUI) in a home network environment, and replacing an integrated remote controller of home appliances of the home network.

[12] In order to achieve the above aspect and/or other features of the present invention, a remote control service processing device in a home network environment, comprises an interface for a data exchange with plural types of devices which are designed to respond to a remote control command received through the network, a storage unit for storing remote control service list information which represents a function responding to a remote controller of the respective devices connected in the network, and a control unit for collecting the remote control service list information from the respective devices, storing the collected information in the storage unit, and providing a certain device in the network with a remote control service to remote control one among the respective devices through a graphic user interface (GUI).

[13] The control unit comprises a database server for collecting the remote control service list information and managing the collected information, and a remote control proxy server for providing the certain device with the remote control service in accordance with the remote control service list information collected through the database server. Upon receiving from the certain device a request for the remote control through the remote control service, the remote control proxy server reads a remote control command from the database server in accordance with the remote control request, and transmits the remote control command to the corresponding device.

[14] The database server maps an icon in correspondence with each device. The icon may be received from the respective devices together with the remote control service list information and mapped. Alternatively, icons may be provided for the plurality of devices for use at home, and mapped if the corresponding devices are connected through the network.

[15] The remote control proxy server provides the remote control service so as to enable the certain device to select through the icon a device for remote control. The remote control proxy server provides an icon representation selection tool as the remote control service, with which a user can selectively display the icon. When the information regarding the selection of an icon is received from the certain device, the remote control proxy server provides the remote control service so that a remote control service page can be displayed to display the remote control service list of the device corresponding to the icon.

[16] The remote control proxy server provides the certain device with a remote control service selection item in the form of a list together with the other available services. When the information regarding the selection from the remote control service item is received from the service list, the remote control proxy server provides a remote control service setting menu for the user to set functions of the respective devices in the network, and a first remote control service page for displaying a remote control service provision menu for the functions of the devices registered through the remote control service setting menu.

[17] When the information regarding the selection from the remote control service setting menu is received, the remote control proxy server provides a second remote control service page which matches the function lists of the respective devices with the devices and represents the result. When a control signal is input in accordance with the function selection of the respective devices in a state that the second remote control service page is displayed, the remote control proxy server provides the remote control service so that a function corresponding to the control signal among the remote control service list displayed on the second remote control service page can be represented in marking. The remote control proxy server further provides the second remote control service page with a confirm button for confirming the setting completion with respect to the selected function. When the confirm button is selected, the database server generates a new identifier with respect to the functions in marking and the respective devices, matches and registers the

functions in marking with the generated identifier. The database server registers the identifier as a device identifier. When the remote control service provision menu is selected, the remote control proxy server provides a third remote control service page so that the devices registered in the database server can be displayed. When the information regarding a remote control request is received from the certain device to the device which is newly registered with the identifier, the remote control proxy server transmits the remote control command sequentially and at a predetermined time interval to one or respective devices with respect to the functions matched and registered with the identifier.

[18] Meanwhile, when information regarding the selection from the remote control service setting menu is received, unlike the case mentioned above, the remote control proxy server may provide a fourth remote control service page to separately display the device corresponding to the control signal in accordance with the function selection of the respective device, and the functions corresponding to the control signal. In this case, the remote control proxy server further provides a confirm button for confirming the completion of setting with respect to a function selected from the second remote control service page. When the confirm button is selected, the database server generates a new identifier with respect to the displayed device and function in accordance with a control signal regarding the selection of the device function, and matches and registers it with the generated identifier. The database server registers the identifier as a device identifier. When the information is received

regarding a remote control request with respect to a device which is newly registered with the identifier, the remote control proxy server transmits the remote control command to one or respective devices sequentially and at a predetermined time interval with respect to the function which is matched and registered with the identifier.

[19] The certain device is a device having a display, and the remote control service processing device as mentioned above may operate as the certain device in the home network environment.

[20] With the remote control service processing device according to the present invention, instead of complicated manipulation of several remote controllers or a complex remote controller, a user can control a remote device in a home network environment having different devices through the GUI from a device having a display. Further, a selection item, realized as a hot-key through the use of GUI, can replace a series of complicated processes using plural remote controllers.

BRIEF DESCRIPTION OF THE DRAWINGS

[21] The above aspects and other features of the present invention will become more apparent by describing in detail an embodiment thereof with reference to the attached drawings, in which:

[22] FIG. 1 is a view for explaining manipulating steps of a remote controller for a conventional home theater system;

[23] FIG. 2 is a block diagram of a remote control service processing device according to an embodiment of the present invention;

[24] FIG. 3 is a flowchart of remote control service processing operation of the remote control service processing device of FIG. 2 according to an embodiment of the present invention;

[25] FIG. 4 is a flowchart of remote control service menu setting operation of the remote control service processing device of FIG. 2 according to another embodiment of the present invention;

[26] FIG. 5 is a flowchart of executing the selection made by the remote control service menu selection setting operation of FIG. 4; and

[27] FIGS. 6 through 9 are views illustrating the screen of a display device according to the remote control service of the remote control service processing device of FIG. 2.

DETAILED DESCRIPTION OF THE INVENTION

[28] Hereinafter, the present invention will be described in detail with reference to the accompanying drawings.

[29] Referring to FIG. 2, a remote control service processing device 220 according to one embodiment of the present invention includes an interface 222, a storage unit 224 and a control unit 226.

[30] The interface 222 includes a wired interface 222-1 for data exchange with a wired communication device such as D1 212,, Dn 216, and SD 218, and a wireless interface 222-2 for data exchange with the wireless communication devices such as D2 214. The respective devices D1,, Dn, SD have information about currently used functions of the remote

controller in the form of lists, and respond to a remote control command received through the network.

[31] The storage unit 224 matches remote control service list information, i.e., the functions of the wired and wireless communication devices D1, ..., Dn, SD responding to the corresponding remote controllers, and stores the same.

[32] The control unit 226 includes a database server 226-1 and a remote proxy server 226-2, and controls the overall operation of the system. Especially, the control unit 226 communicates with, and thus collects the remote control service list information of the respective devices D1, ..., Dn, provides a certain device SD with the information about the respective devices D1, ..., Dn, and upon receiving a remote control request from the certain device SD, transmits a remote control command to the corresponding device based on the collection of the remote control service list information.

[33] The database server 226-1 collects remote control service lists from the respective devices D1, ..., Dn, and builds and manages a first database DB1 based on the collected information. The database server 226-1 also generates new remote control service list information through the communication with the certain device SD, and generates a second data base DB2, or updates the first database DB1 and manages the same based on the newly generated remote control service list information. FIG. 2 shows the first and the second separate databases DB1, DB2 for the respective storage of information.

However, it is also possible that the information of the first and the second databases DB1, DB2 is combined into a single database.

[34] The remote controller proxy server 226-2 provides the certain device SD with a remote control service so that the respective devices D1, ..., Dn connected to the network can perform remote control command through the graphic user interface GUI with reference to the first database DB1. The remote control service is provided in icon form, and web page form. When a remote control request is received from the certain device SD through the remote control service, the remote controller proxy server 226-2, in response to the remote control request, transmits a remote control command to a corresponding device 210 with reference to the first or the second database DB1 or DB2.

[35] Here, the 'certain device SD' refers to a display device such as a PDP, by which a user can receive remote control service through a screen, and also input various commands through input tools such as a mouse, keyboard or a remote controller for the certain device. The remote control service processing device 220 may act as the certain device 218.

[36] FIG. 3 is a view showing a signal flow in order to explain a remote control service processing operation of the remote control service processing device 220 of FIG. 2 in accordance with one embodiment of the present invention. First, as a connect request is transmitted from a device 210 connected to the network, the DB server 226-1 of the remote control service processing device 220 sends back a response message to the connect request,

and inquires whether there is the remote control service list information. When the device information and remote control service list information are received from the device 210, the DB server 226-1 sends out a response message about the message reception, and also matches the device information and the remote control service list information to register in the first database DB1. When registering the device information and the remote control service list in the first database, an icon corresponding to the device 210 may be mapped. The icon may be received from the respective devices 210 together with the remote control service list information, or alternatively, the remote control service processing device 220 possesses predetermined icons for the plurality of devices used in home and then they are mapped when a corresponding device is connected through the network.

[37] When the database is built with respect to the respectively connected devices, the remote controller proxy server 226-2 of the remote control service processing device 220, i.e., the device having a display (hereinafter called PDP 218) provides the remote control service in the form of an icon (see FIG. 9). When the DVDP is selected as shown in FIG. 9, a menu of available remote control services of the DVDP is displayed as shown in the lower half of FIG. 9. FIG. 9 shows the 'Power on' item by way of an example, however, various control items can also be displayed. Further, in addition to the icon, the remote control proxy server 226-2 may also provide an icon representation selection tool (not shown) for the user to choose whether to show the icons of FIG. 9 on the screen or not.

[38] Meanwhile, when information is received following the selection of the remote control service on the service menu page by the remote control proxy server of FIG. 6, for example, when the home portal service is selected as shown in FIG. 9, or when a service menu display is requested by the input through the service menu key of the input tool or by placing a mouse pointer on a certain point of the screen, the remote control proxy server 226-2 sends a request to the DB server 226-1 for the information about the devices registered in the first DB, DB 1. When the requested information is provided by the DB server 226-1, the remote control proxy server 226-2 provides the PDP 218 with the lists about the registered devices. Next, when the information is received following the selection of a certain device among the lists provided by the PDP 218, the remote control proxy server 226-2 sends an inquiry to the DB server 226-1 about the remote control service list of the selected device and provides the same to the PDP 218. When the information is received from the PDP 218, following the selection of one item among the remote control service list, a command code corresponding to the received information is read, and transmitted to the corresponding device 210.

[39] The device 210, upon receiving the command code as described above, transmits a remote control command to the control unit (not shown) of the device 210 in accordance with the received command code, and therefore, the control unit of the device 210 performs the function in the same way as it is instructed through the remote controller.

[40] Meanwhile, when the remote control proxy server 226-2 provides the PDP 218 with the information about the devices registered in the database, the remote control proxy server 226-2 may match the information with the respective devices and provide the remote control service page so that the respective functions can be displayed together. Then, when the functions of several devices are selected by the user simultaneously and the selection confirm signal is received, the remote control proxy server 226-2 may register the functions of the selected devices in the database as new devices or identifiers so that, upon receiving a remote control request for a new device or an identifier, the remote control proxy server 226-2 can sequentially transmit the commands which are mapped according to the new devices and functions at predetermined time intervals. As a result, a single selection command can replace plural times of manipulation of multiple remote controllers (see e.g. Figure 1) to operate plural devices of a combination system such as a 'home theater' system.

[41] FIGS. 4 and 5 show flow of signals in the remote control service processing operation of the remote control service processing device 220 of FIG. 2 according to another embodiment of the present invention. FIG. 4 shows a signal flow in the process of setting user's frequently used functions of the devices connected in the network, and FIG. 5 shows a signal flow in the executing of the selection made by the remote control service menu selection setting operation of FIG. 4. In FIGS. 4 and 5, data processing the remote control service lists collected from the devices connected in the network into

database is identical to the same process as described above with reference to FIG. 3. Accordingly, detailed description thereof will be omitted.

[42] Referring to FIG. 4, when the information is received in accordance with the selection on the remote control service from the service menu page having lists of available services, as shown in FIG. 6, the remote control proxy server 226-2 provides the remote control service menu page. When the remote control service selection menu is selected from the PDP 218, the remote control proxy server 226-2 provides the remote control signal setting page as shown in FIG. 7. At this time, a confirm button (not shown) is additionally provided to the remote control signal setting page to instruct the completion of the remote control setting. After that, when the control signal is received, following the selection of a certain function through an input tool, the remote control proxy server 226-2 causes the device and function corresponding to the received control signal to be displayed on the screen, and upon receiving the information in accordance with the user's selection of the confirm button, establishes the database in accordance with the control signal as selected through the input tool. FIG. 7 is a view illustrating the screen displayed in accordance with the control signal selected through the DVD remote controller and the AMP remote controller.

[43] Meanwhile, in FIG. 4, in building a database directly through the remote controller, device identifiers are generated with respect to the devices and the functions which are displayed in accordance with the control signal inputted through the input tool, and the device identifier are matched and

registered in the second database as the devices having new service names or previous service names. In the case of selecting functions of various devices, the functions can be registered as a new device service name, and in case of selecting plural functions of one device, the functions can be registered under the service names of the corresponding device. There is another way of building a database, in which marking is performed in the remote control service lists of the devices in accordance with the control signal selected among the previously-built first database. The marking information is matched with the new device identifiers and registered in the first database as new devices, to thereby build the database. In the first and the second way of building the database, when the new devices or the identifiers are registered in the database together with the remote control service lists icons, corresponding to the registered devices, may be mapped. With respect to the devices that are newly generated through the identifiers, preset icons may be applied. With respect to the already registered devices, the corresponding icons may be displayed or new icons may be applied among the preset icons.

[44] While the database is built as described above, the remote control proxy server 226-2 may display the icons (not shown) for the device identifiers which are newly generated during the screen display of the PDP 218 (FIG. 9).

[45] Meanwhile, after the remote control service setting menu is newly registered through the process as shown in FIG. 4, as a remote control service provision item is selected from the second screen of FIG. 6, the remote control

proxy server 226-2 provides a page so that the list of registered devices of the first database or of the newly generated second database can be displayed on the screen. Then with a selection of a certain device, the remote control proxy server 226-2 requests through the database server 226-1 for the remote control service list information of the registered devices of the database, and upon selection of a certain item from the remote control service list, reads a command code from the database according to the selection command and transmits the read data to the corresponding device 210. When a newly registered device under a new service name is selected from the second database, i.e., when plural functions of plural devices are selected through plural remote controllers, the remote control proxy server 226-2 sequentially transmits the read command codes to corresponding devices at predetermined time intervals.

[46] The device 210 receiving the command code transmits a remote control command to a built-in control unit (not shown) according to the received command code, and the control unit performs the function in the same way as it is instructed through the remote controller for the device 210.

[47] With the remote control service processing device as described above, a user can control a remote device in a home network environment having different devices through the GUI, or control the respective devices of a combination type system. As a result, a manufacturer's heavy burden of having to develop an integrated remote controller is lessened, and on the

customer's part, they have less financial burden of having to buy the integrated remote controller, which is usually expensive.

[48] Further, a selection item, realized as a hot-key through the use of GUI, can replace a series of complicated processes using plural remote controllers. Accordingly, user convenience is improved, and system utilization is also improved.

[49] Although a few embodiments of the present invention have been described, it will be understood by those skilled in the art that the present invention should not be limited to the described embodiments, but various changes and modifications can be made within the spirit and scope of the present invention as defined by the appended claims.